

# Zero Beat

Hampden County Radio Association, Inc. - our 45th ARRL affiliated year

March 1993

## Next HCRA Meeting

The next Hampden County Radio Association meeting will take place on March 5, 1993 and will be an "open forum" meeting. This is your chance to discuss your feelings about the HCRA. Many topics about the club will be covered, so please be sure to attend. The board is doing this to see what can be done to improve the HCRA and make it the best possible club for the membership. Doors open at 7:30, with the meeting starting promptly at 8:00 P.M. Hope to see you there!

Feeding Hills Congregatjional Church  
Route 57 & 187  
Feeding Hills, Massachusetts

The next board meeting will take place at Greg Stoddard's QTH. This meeting will take place on March 11, 1993 at 7:30 P.M. Anyone is welcome, feel free to ask for directions.

## Club Officers



## Board of Directors

### Expiring 1993

WA1YCA  
KA1TBS  
KA1QFE  
N1GVV

Tryon Cote  
Fred Gore  
Bob Gutowski  
Adam Olson

### Expiring 1994

KA1WER  
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Build Your Own 446 MHZ antenna - Pg 5

## President's Message

On behalf of the Board members I want to thank Chet Kalis, W1HGJ, and Stan Bates, N1INB for the great presentation on ATV they put on at last month's meeting. Over 55 members attended and everyone left knowing a little more about the subject.

As mentioned in prior Zero Beat issues, the agenda for this month is OPEN ISSUES night. Frankly this is your meeting. The Board members will be in attendance and will be eagerly waiting to hear from club members. We plan on discussing whatever club members wish to discuss. We'll also cover topics such as survey results, Field Day and the annual election of officers. I know it's been said before, but we need your help and your input! For our club to remain strong the members must participate. Enough said, hope to see you all there.

73's-Larry, N1EPE

## Product Review

### PRODUCT REVIEW

by  
LARRY-N1EPE

Recently I ordered a catalog from HAM-SOFT at a cost of one dollar. Since many of us use computers in our hobby I thought you'd be interested in my review of the catalog. I'm impressed. There are about 300 shareware and public domain programs listed covering many amateur radio topics such as logging programs, ATV, EME, packet radio, satellite info, antennas and circuit design. In addition, some of the other programs available include FAX, SWL, clip art, weather/hurricane tracking and geography!

If interested in receiving the catalog, just send \$1.00 to:

HAM-SOFT  
P.O. BOX 443  
GALENA PARK, TX 77547-0443

## March Radio Factoids + Events

### March Radio Factoids

George Ohm, German physicist and mathematician who, in 1827, published his study of the Galvanic circuit, stating the relationship known as "Ohm's Law".

### March Radio Events

March 6th + 7th: 1993 ARRL DX PHONE CONTEST 0000Z (48 hours)

March 27th + 28th: 1993 CQ WPX PHONE CONTEST 0000Z (48 hours)

*Zero Beat is a monthly publication by the Hampden County Radio Association, Inc. Any article may be reprinted as long as credit is given to the publication and it's author(s). This issue would not be possible without the help of your board of directors, Stan Hilinski KA1ZE, and Scott Cohen, KA1QAS. Special thanks also go out to Jerry Griffin, WA1PGT, for use of his computer equipment. Thanks, editor (NR1L).*



# SPOTLIGHT ON THE CROWD

A Focus on a member  
of the HCRA

IN THIS ISSUE:

Bill Snigg KA1MZF

## 1. Please introduce yourself

"Hello, my name is Bill (William F. Snigg), KA1MZF. My QTH is Suffield, CT. I have been licensed since 1985 and presently hold a General class license."

## 2. How did you get started in ham radio?

"For some time, I was on SWL, first with a Radio Shack 9-band receiver. I then purchased a Yaesu FRG-7, a general coverage receiver. One time, I tuned to hear a couple of local hams on the 9-bander, chatting on a 2 meter frequency. I eventually learned that one of the operators was involved in a Novice class being conducted in West Springfield, MA. I soon signed up, and it took no more than one class before I became proficient at copying 5 WPM."

## 3. Did you have an elmer?

"I did not have an 'Elmer,' but went to classes to obtain the necessary background for the exams in the respective classes. For the code requirement, I used various tapes, plus I listened to the practice transmissions on W1AW."

## 4. What type of equipment do you use?

"The rig is a Kenwood TS 530S, with a separate MFJ tuner. My usual mode of transmission is on SSB, employing a dipole antenna strung up in the attic. This antenna was originally cut for 10-meter operation, and using the tuner I have had, at times, very favorable results on the other bands."

"I first started using a random length of wire, supported by a tree at the end of the yard. Since there was a north-south orientation, the majority of contacts I made were in the Southern United States, Central America, and South America."

"Later, I tapped into the mid-point of the random wire with ladder line. This arrangement did not come up to my expectations, so I generally resort to the 10-meter dipole."

## 5. What areas of ham radio are you most active?

"Most of my radio activity is in the SSB mode, with very little being done on CW. I prefer the 'rag-chew' type contact, being short or long. I don't care much for contesting, so when there is one in progress, I usually tune to the WARC bands. I occasionally respond to a CQ contest call, mainly for the purpose of getting a signal report."

**Continued on page 4**

*Spotlight on The Crowd is a monthly article by club members and for club members. It is essentially a biography of members of the HCRA. I will be selecting members each month at the regular meetings to interview for this column, using the same questions monthly and they will appear in this same format. If you would like your biography in ZB, please let me know in person, or send me your biography in the mail. Thanks, editor (NR1L).*

## Spotlight on The Crowd (Cont.)

### 6. What goals do you have in ham radio?

"Whether it can be classed as a goal, or more like a wish, I hope that some day I may be able to set up some improved antenna equipment. I may then have the kind of QSO's I only hear or read about."

### 7. What have been your major accomplishments in ham radio?

"I would have to say that, not having a great efficiency for electronics, my major accomplishments in ham radio have been in being able to pass the exams necessary to obtain the respective classes of Novice, Technician, and General."

*"I would have to say my thrill in ham radio is each little step you climb on the way up the ladder of examinations. Passing the General exam was great, I soon was able to explore the various SSB bands."*

**Bill Snigg, KA1MZF**

### 8. What was your biggest thrill in ham radio?

"I suppose each step on the road was itself a big thrill! I recall my first QSO on CW, when I was trying to overcome nervousness. Another big thrill was in passing the General exam, permitting me to explore the world of phone operation on many bands."

"A thrill yet to be realized is when our son, Steve KB4OLG, is able to assemble the proper equipment, whereby we can have a QSO."

### 9. What are your interests outside ham radio?

"During the winter months, when I am not on the radio, I do quite a lot of reading. The local library is just a short walk from the house, so I can readily exchange books when some may not appeal to me."

"I volunteer two hours a week for the library, performing what is called 'monitor duty.' The library sought such volunteers back at a time when students coming in after school tended to be too boisterous. Fortunately, this situation had abated considerably, so now in quiet moments I can assist in placing returned books back on the shelves."

"In the warm weather months, yard work can take a good bit of my time. What I often wonder is, where is all this time a retiree is supposed to have?"

## Future Meetings

**March-** The board has decided to make this an "open issues" meeting. The HCRA wants to make sure that everyone has a chance to voice his or her opinion about the way the club is run. Field Day will also be discussed with the dilemma of how to make this more of a club activity, rather than a few selected hams. It should be one activity in which our whole organization is involved. This way in an emergency the HCRA would be prepared to respond. If you have any gripe at all come to this meeting and voice your opinion!

**April-** In April we will have a representative from the ARRL to give a product review on some of the

newest toys out there. This would be a great opportunity to get an idea of what gear you should be shopping for.

**May-** This meeting we have planned a speaker to discuss feedlines. This is a great chance to see a technical meeting for those of you that miss seeing Tech Corner. Ed O'hare will show you all about feedlines and related topics.

**June-** The board has still not decided on the June topic. However, the HCRA's elections will be held at this meeting. Also don't forget about Field Day on June 26th and 27th.

## Build Your Own 446 MHz Antenna

by Ron Klimas WZ1V

### A SIMPLE YET EFFICIENT 446 MHz 6 ELEMENT YAGI

In preparation for a VHF/UHF Contest, I realized that I had no vertically polarized antenna for 446 FM. I thought about purchasing a small Cushcraft yagi or vertical, but then thought it might be cost-effective and fun to homebrew something. Having a PC and 2 programs for yagi design analysis available, I booted up and started looking for models I could scale up for 70 cm. Wow, I already had a few of W1JR's 6 meter designs on file. Joe is certainly a knowledgeable antenna man, and I started reminiscing about some of the times we had met up at antenna measuring conferences. He always was bringing new antennas to these gatherings, even before joining Cushcraft, and had quite a few winning entries over the years. I then remembered an unusual yagi he had designed for the commercial 916 Mhz STL band, and how I had asked him what kind of crazy driven element that was on the antenna. This yagi had no matching device of any kind! How could it work without a T-match? Joe just smiled and said it was a coaxial half-wave, that the antenna was broad-banded, and provided a good SWR with direct coax feed.

Years passed by. Wait a minute! Why not use these programs now to analyze the driven element impedance of some of these present 6 meter designs? I decided to scale up W1JR's 6 element yagi to 446 Mhz. I sure was happy to see a 24 foot boom monster shrink to 3 feet on 70 cm! I opted for .125 inch diameter solid aluminum elements, entered the data into

YAGIMAX 1.02, and let it crank out the results. Wow, over 12.5 dbi, not bad! But, the driven element impedance was only 12 ohms -- you could never feed this baby directly, unless you like having warm coax! Then I remembered how Joe mentioned that his STL yagi was broad-banded. I wondered what this could do for me. I decided to leave the element spacings alone and play with their lengths only. Let's see, if you make the reflector longer and the directors shorter, the bandwidth should increase. Hours turned into days. My eyes had that CRT glare in them. I put on my dark sunglasses and took a closer look at the big picture. I could see that driven element impedance was more constant with frequency, which resulted in a greater SWR bandwidth. I also had managed to increase the driven element impedance to 20 ohms (I remembered that greater bandwidth = lower Q = higher impedance), but still not a good match. I also became aware that I could null out the reactance by adjusting the driven element length. What else could be done to further increase the impedance? Ah-hah! Why not play with the element diameters? Sure as sheep, smaller diameter elements raised the feed impedance. Using 16 gauge bus-wire elements, I had managed to get the feed impedance up to about 38 ohms resistive. Would this be close enough? It was time to build and find out!

I went home that night and rummaged through my scrap antenna parts piles (the local dump has piles like this also). I selected an old TV antenna with a 1 inch square boom, and sawed off its' elements.

*Continued on page 6*

## Don't forget the Flea Market!!

This is just a reminder that the HCRA's flea market is coming up around the corner. It will take place on Sunday, April 18, 1993, and will be held at the Southwick Recreational Center in Southwick, Massachusetts. Talk in frequencies are 449.175 AC1T/R and 146.520 Simplex. Doors will open for general admission at 9:00 a.m. and for vendors only at 6:00 a.m. We will also be conducting Radio VE Exams. It is suggested that if you are interested in taking a test that

you pre-register by calling Yorke Phillips, K1BXE. Yorke is the HCRA's VE Liaison. If you are interested call Yorke @ (413) 566-3010. General admission for this event is \$3.00. Vendor tables are \$10.00 in advance and \$13.00 at the door if available. For more information pick up one of the flyers at the next meeting or contact Paul Geng @ 114 Riviera Drive, Agawam, MA 01001. His phone number is (413) 789-2334. Please call before 10:00 p.m.



## Build Your Own 446 MHZ Antenna (Cont.)

I decided to keep things simple for experimental ease, so I would use self tapping metal screws and solder lugs to attach each half element to the boom. This was ok for the parasitic elements. I thought about the driven element. I could mount a BNC chassis connector on the boom, and have an insulated half element plug into it (filling the inside of the plug with Duco plastic cement), but how could I attach coax to it or tighten it? I couldn't. So I cut away a gaping hole into the side of the boom for access. Not very neat, but I could get longnose pliers to hold the nut and ground solder-lug on the inside of the boom. I then realized that a balanced driven-element needs a balun for coax feed. No problem -- I would run the coax through the middle of the boom, having it exit an electrical quarter-wave from the driven element (about 7 inches). This would form a classic quarter wave coaxial sleeve balun. The one thing that did look odd about the antenna was that the upper half of the driven element appears much longer than the reflector. The reason is that the wire has to protrude 6.25 inches from the END of the BNC plug. (Start with 6.5" if you want to prune). All the other element lengths are measured end to end, or from center of the boom to end for each half.

Test Time! Luckily, I have access to an IFR spectrum analyzer, and know how to sweep an antenna with it. I began by just plugging in the BNC insulated half driven element, and attached its' grounded half below it. I used a machine screw, nut, and additional solder lug for the grounded half element on the inside of the boom, so I could re-inforce the BNC connector ground lug by tying the two together inside. With no other elements mounted, I started sweeping the driven element by itself, going +/- 100 Mhz either side of 446 Mhz. I had made the initial lengths long so I could measure and prune using diag cutters. I cut until I had nulled out the standing waves right at 446 Mhz. I then mounted the rest of the parasitic elements on the boom and pruned them to length. Could it be true? A nice

flat null exactly 3 db down from the generator amplitude centered on 446 Mhz. (A perfect 50 ohm match.) I took the thing home and confirmed the SWR bandwidth on my Bird with that of the computer. Both measurements agreed with the computer analysis. As a matter of fact, the reflected power at 446 Mhz. measured zero on the Bird! I attribute the better than expected SWR to the coaxial sleeve baluns' effectiveness.

Although, I didn't set up an antenna range to evaluate the antennas' performance, I made comparison measurements using the HT rubber duck and switching back and forth to the yagi. Needless to say, the yagi was leaps ahead of the quarterwave. The yagi was then rear mounted on a tower leg about 60 feet up and pointed northeast (where most of the activity is for me). For some of you that worked me during the January Contest, this is what I used on 446 simplex. After the contest, we had a major ice-storm here on the mountain. After the ice melted, a close look at the antenna showed that none of the elements had been bent at all. This proved my reasoning that I could get away with small diameter buswire elements as long as the antenna was vertically polarized. The ice actually adds support to the elements in this case.

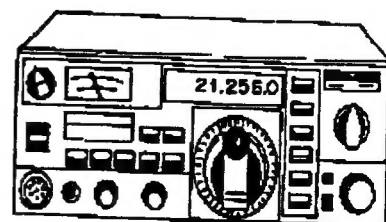
The best part of this project for me was to see the excellent correlation between what the antenna modeling programs computed, and actual measured results showed. My advice to anyone that always wanted to experiment with antennas but felt intimidated by the so-called "Black-art" stigma associated with antenna design (as I used to be), is to pick up the shareware program YagiMax, and see how quickly you will dispel these myths for yourself.

73, Ron

*Continued on Page 7 (Diagram)*

## Reminder!!

This is just a little reminder to let you know that the club call, W1NY is available for any members to use for any radio event such as contests and dxing. Just write a little note to the board of directors to ask.



## Build Your Own 446 MHz Antenna (Cont.)

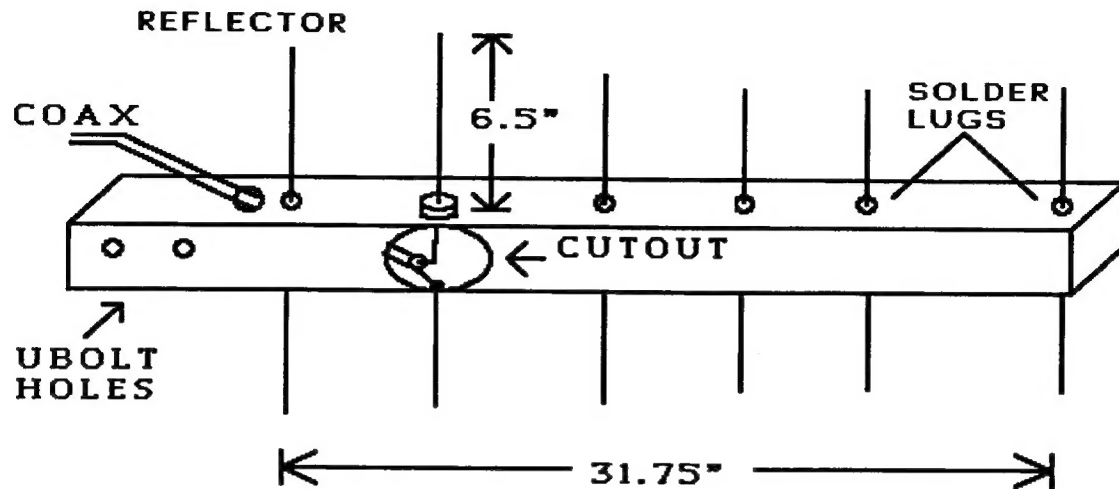


FIG. 1: CONSTRUCTION DETAILS.  
440-450 MHZ. 6 EL. YAGI.

ELEMENT	LENGTH (in.)	SPAC. TO REF. (in.)	ELE. DIA. (in.)
Reflector	13.2500	0	0.05080
Driver	12.4500	5.2500	0.05080
Director 1	11.7500	12.0000	0.05080
Director 2	11.5000	18.5000	0.05080
Director 3	11.5000	25.0000	0.05080
Director 4	11.7500	31.7500	0.05080

FREQ (MHZ)	GAIN (DBI)	F/B (DB)	IMPEDANCE (ohms)
442.000	10.82	16.16	39.83-j4.55
443.000	10.88	17.19	39.63-j3.32
444.000	10.94	18.43	39.23-j2.04
445.000	11.02	19.96	38.62-j.7
446.000	11.10	21.91	37.8+j.76
447.000	11.18	24.52	36.77+j2.37
448.000	11.28	28.08	35.55+j4.17
449.000	11.38	31.37	34.17+j6.2
450.000	11.49	28.78	32.65+j8.49

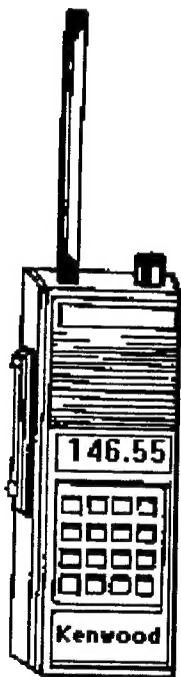
## Observations from Handi-Hams

### Observations from Handi-Hams

by Mike Cafferky, AA6WQ

"The biggest challenge I have is in convincing them they can pass the test," says Dave Rutledge, W9KRQ, a volunteer code instructor for the Handi-Ham Radio Camps.

"My main job is boosting their confidence," agrees Dave Block, KA0VCW, the other volunteer CW instructor at the camps. Learning Morse code appears to most people as a significant mountain to climb on their way to broadening their operating privileges on the amateur bands. To a physically challenged person the task can at first seem almost impossible to achieve. However, once these students begin believing they can achieve, there is almost nothing that will stop them.



Consider the variety of situations these and other volunteer instructors face in helping Handi-Hams learn code: a blind and illiterate young man interested in participating in radio; a young paraplegic woman determined to enhance her communication skills; an older man who suffered a stroke but always wanted to be an Amateur Radio operator; a young man with cerebral palsy who has learned to communicate

with near perfection using Morse code; a blind and deaf young man who learns code using Braille-related technology. You may have guessed where I am headed with this: If they can succeed in code, why can't we? True, but there's more to the story than just moralizing.

As most readers may know, people who have profound learning challenges may apply for an Amateur Radio license and have the code requirement waived. They may also become a part of the Amateur Radio community through the no-code Tech license. While there are some students who exercise these options, many participants in the Radio Camp are interested in continuous wave and want to learn like everyone

else. They show a high level of grumpton and desire to enter the ranks in the traditional way. "The key ingredient from the student's point of view," says Dave Rutledge, "is motivation."

### CW at Radio Camp

Students come to camp on referral from an educational counselor or other interested Amateur Radio operators. They spend the week at a camp which is staffed and outfitted for a variety of campers and their needs. Many of the radio teachers and technicians are volunteers who get their reward simply from the positive experience of helping others succeed.

The volume of campers who study Morse code varies by the make-up of the group. If there are a lot of unlicensed campers, five or six may sign up for code instruction under the leadership of "the two Daves." If many of the campers are already licensed or have already achieved their goals in Morse code, there will be fewer code students.

Learning radio theory at the Radio Camp can be done in small groups, but code instruction is accomplished one-on-one. Dave Block, a volunteer with Handi-Hams since 1984, uses an MFJ keyer and benchner paddles in his instruction as he leads campers one letter at a time. He helps students find ways to make their copying skills more efficient with the technology most appropriate for each.

Dave Rutledge, a former personal student of the famous Farnsworth, uses a keyboard and the Farnsworth method for his tutoring sessions. As student's progress, Dave begins using audio code tapes which have been generated by a computer to simulate test conditions. He reports that students enjoy the tapes because they have real-to-life QSO conversations at speeds which prepare them to advance to the next higher level of testing.

Dave is skilled at using the Braille writer instrument as well as the Braille slate and stylus system machines which help an operator decode dits and dahs into alphanumeric Braille characters. The Braille writer has six keys and a space bar used for creating the raised bumps on paper characteristic of the Braille code. Dave knows Braille code and can easily check for copying errors by reading the printout created by the Braille writer equipment.

**Continued on Page 9**



## Observations from Handi-Hams (Cont.)

Quadriplegic radio students present another interesting challenge: sending Morse code without the use of their hands or feet. The most common solution seems to be electronic keyers modified with microswitches moved by air pressure. These "puff and sip" (sometimes called "huff 'n puff" or "sip 'n blow") systems, using ordinary drinking straws linked with pressure-sensitive microswitches, assist the radio operator in keying his or her rig with carefully timed inhalation and exhalation.

"We get very bright students at the camp," comments Dave Block, an eight year veteran at teaching Handi-Hams. "The learning challenge our students face is not because of mental deficiencies. They sometimes don't believe they will be able to do what Morse code demands of them, but they do achieve," he adds. They simply have more of a challenge in encoding and decoding Morse data. The various modified keying and copying devices seem to be simple interface hardware which, when coupled with their own mental processes, become efficient communication modems.

When asked if there are students whom he has not been able to help because of the

Significance of their learning challenges, Dave Rutledge quickly says, "No. All of the students make progress. There are some who do not pass the code test the first time just like anyone else, but they all make progress. We have technicians who can make modifications to their code keyers. This is an additional encouragement. We all give constant encouragement and we always see results."

"Some students may have to learn code in an entirely different way than do others," adds Pat Tice, WA0TDA, who writes about the Handi-Hams for *Worldradio*, "but they continue to learn code and achieve their Amateur Radio goals. Just like in the rest of society, there are some Radio Camp students who have a little easier time than others learning the code. But those who really have the desire to learn it do so."

**Editor's Note:** The preceding article was taken from *Worldradio*, February 1993. Special thanks go out to Al DeCoteau, KA1ZUK, who sent me this article. With more HCRA members such as Al, *Zero Beat* will continue to be a premiere publication. Thanks, editor (NR1L).

## June Election Info

Well, it is coming close to that time of year again, the HCRA's annual election. If you are interested in running for a position, we strongly recommend it this year! This would be a great opportunity for you to participate and help turn this club into one of the best around. This year we will have several positions open for candidates. President, Vice President, and 4 board positions. Don't be shy, if you are interested please contact Larry, N1EPE, or any other club officer. If you are not sure what is involved, you can ask any of us, or better yet attend the board meeting on March 11 at 7:30 P.M. This month's board meeting will occur at Greg Stoddard, N1AEH's house. Greg lives in Suffield, CT near Riverside Park. Don't Hesitate to ask for directions at the next meeting. This would be a great chance for you to experience exactly what goes on at one of these meetings. Anyone is welcome. Keep in mind that this year's

election will be held at the Church. This will allow for more club participation. The board made this decision based on the surveys and poor attendance when it was combined with the banquet. This meeting will also have a speaker in addition to the election itself. This year's election policy will remain similar to the past year's system, mainly because of the HCRA's by-laws that must be followed. If you are not pleased with this system, be sure to attend the next meeting and let us know.

73, Kevin NR1L

This month, I would like to start off to thank all the HCRA members who have contributed for Zero Beat the last two issues. The articles I received were excellent, and I felt my first issue was a success. However, please keep it up. I need articles from the general membership as well as from the board. I had enough for this issue, but I am skeptical about the months to come. If you see anything interesting at all that you would like to share with the membership, don't hesitate to mail me a disk copy, or the typewritten article itself. See last months issue for more info. These issues would also not be possible without Fred, N1DPM, Tryon WA1YCA, and other board members. They have taken the issues each month to the copier and they have also stamped and labeled each issue, over 150 of them. Their help is greatly appreciated. The printing of these issues is done on a laser printer, thanks to Jerry Griffin, WA1PGT.

The equipment used to provide you with Zero Beat each month consists of a BCS 486DX 33MHZ computer purchased from Jerry Griffin, WA1PGT. The software I use is Microsoft Publisher and Microsoft Word for Windows. I feel that the combinations of these two pieces of software offer me the greatest ease of operation and the best of looks.

Many HCRA events are coming up around the corner. The March meeting is important for our club and your attendance would be greatly appreciated. I don't want to say too much about it, as it is elsewhere in this issue. See the president's message for more info. The flea market is also coming up in April, with Field Day soon to follow in June. For those of you out there that are avid HF contesters or would like to up your country total, don't forget two big contests in the month of March. On March 6th and 7th the 1993 ARRL DX PHONE contest will commence. Look for NR1L (+KA1QAS, op) on 10,15, and 20 meters. Hope to work you. Another big HF contest in March will occur on March 28th and 29th. This will be the CQ WPX cocontest. A great one if you are trying for a prefix award. Well, not much more from me this month, hope to see you at the next meeting.

73, Kevin

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Address correction requested



Giant Panda

First Class Mail

RC1T E V C A 14 I 10/93

